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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/698,274	10/30/2000	Shinya Yamaguchi	520.39251X00	6630

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EXAMINER

ABRAHAM, FETSUM

ART UNIT	PAPER NUMBER
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2826

DATE MAILED: 10/24/2002

B

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/698,274

Applicant(s)

YAMAGUCHI ET AL.

Examiner

Fetsum Abraham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-10, 12-15, 19, 20, 30-33 and 35-37 is/are pending in the application.
- 4a) Of the above claim(s) 20 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19, 30, 31, 35 and 37 is/are allowed.
- 6) ☒ Claim(s) 4-10, 12-15, 32, 33 and 36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

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Claims rejection

1. A telephone interview was conducted between Mr. William Solomon and examiner Fetsum Abraham on 10/17/02 to maintain mutual understanding on the active claims on the application. An agreement is reached that claims **4-10, 12-15, 19,20,30-33 and 35-37**, all device claims are the active claims. In light of the understanding, it was mutually agreed that all method claims should be withdrawn from consideration.

a. However, since claim 18 is canceled from the application in amt A, its dependent claim 20 has been withdrawn from consideration, making the active claims to be **4-10, 12-15, 19,30-33 and 35-37**.

2. Claim 4 recites the limitation "the alloys" in claim 4. There is insufficient antecedent basis for this limitation in the claim.

As a matter of suggestion, "the alloys" should change to read "their alloys" if the intention was to indicate the alloys of the materials in the claim.

Claim 7 recites the limitation "the two to five" in claim 7. There is insufficient antecedent basis for this limitation in the claim.

The expression "of" needs to be inserted between "channel" and "the two" in line 2 of the claim.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claim 4-10,12-14,36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al (6,348,368).**

The patent discloses a crystallized active transistor layer with grains joined by (111) twin boundaries (see column 14, 42-67). In claim 3, It discusses the type of materials used as catalytic agent in the layer to transform the amorphous material into a crystalline material. One of the used agents is Pb, which is a group 4 material. Clearly, a gate electrode is mounted on the active layer via gate insulation layer since the product is TFT.

Further, as to claims 4,14, although the patent omits to disclose the claimed "alloys" of the agents as part of the agents, claim 3 indicates the possible existence of other associated materials or alloys with the agents by the expression "at least one selected from" to indicate material types associated with the agents. Therefore, it would have been obvious to one skilled in the art to conclude the existence of agent alloys in the crystallized TFT layer.

As for claims 5,10,12 since currents in TFTs travel through the channel, and that the channel is the crystallized TFT with the claimed crystal orientation, it is clear that the claimed operation is met by the prior art. Further, although the exact terminologies as that of the claim such as "dendryte" is not used, it is clear that there are crystallized regions in the active layer of the prior arts

As for claims 6,7, the crystallizing agents of Yamazaki are oriented parallel to the substrate. The claimed insulating substrates are also most common substrates in TFT formation.

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Besides, the **plane orientation** with (111) crystal oriented layer is taught to be (110) (see column 14, last paragraph). As for the claimed layer thickness or general layer dimension is notoriously known as one of the most common variables that differ from a design to another based on an expected result. The magnitude given is also known to be within the range of "thin films" as understood in the art. Besides, the specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). As for the mobility of the active layer, the element is again variable and heavily dependent on doping profile and concentration of crystallizing agents. Therefore, it is clear that the claimed amount of mobility alone can not be patented.

Further issues concerning claim 7, the crystal grains in the active layers of the cited references are not restricted to a defined number. Therefore, it is clear that the claimed number of crystals is also covered in the references.

As for claims 8, 13 no specifically unique physical substance can be deduced from the mathematical expressions unless fully detailed and shown by the applicant to contain something different from the thin film in the prior art. Therefore, it is understood to be a similar film to that in the prior art.

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As for one structure on the polysilicon active layer in claim 7 is concerned, both TFTs have gate insulation structures on the active layers. As for said one point in claim 12, the crystals are finally connected to one another forming a larger crystal in such active layers.

As for claim 9, although the exact terminologies as that of the claim such as "dendryte" is not used, it is clear that there are crystallized regions in the active layer of the prior arts. As for the amorphous layer containing crystallizing agents, crystallized layers are originally amorphous and metal agents are usually introduced to such layers in order to crystallize them, and that has already been addressed.

As for claim 36, metals are known gate materials.

Claims 15,32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al (6,291,852).

The patent disclose a MOSFET channel with a bottle neck structure in column 7, 15-25. Although the literature does not specifically indicate the structure as being to applied to thin films, it is clear from the entire subject matter in the patent that it applies to thick and thin film structures. Therefore, it would have been obvious to one skilled in the art to safely utilize the shape to thin film, since channels are commonly known to form in thin film layers directed to TFTs as shown in layer 48 of figure 17A, and since the structure provides highest potential energy potential in the current path.

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As for claim 32, any channel between multiple gates in IC structures with any one channel of the claimed bottle neck structure reads on the claim. And it is common in the art to form multiple MOSFETs on a single substrate including on that of the prior art.

Claims 15,33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al (6,291,852) in view of Yamazaki (the primary reference).

The prior art discloses all subject matter except the crystal orientation of the layer. However, Yamazaki as discussed in detail, shows the thin film with the claimed crystal orientation./ therefore, it would have been obvious for one skilled in the art to use a thin film in all TFTs since the structure provides superior channel mobility.

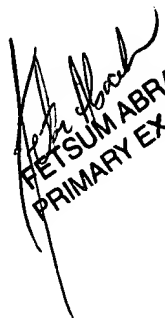
Claims 19,30,31,35,37 are allowed.

Any inquiry concerning this communication should be directed to Fetsum Abraham at telephone number (703) 305,3793, or by Fax, at (703) 746,4125, or by E-mail at ***fetsum.abraham@uspto.gov.***

Any inquiry of a general nature or relating to the status of this application should be directed to the ***SPE of AU:2826*** at (703)308-6601, or the ***Group receptionist*** at (703) 308-0956.

Fetsum Abraham

10/17/02


FETSUM ABRAHAM
PRIMARY EXAMINER

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